

Docket No. 500.43431X00
Serial No. 10/765,984
Amendment Under 37 CFR §1.312

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (Previously Presented) An optical switch comprising:
 - a collimator array including a plurality of input collimators and a plurality of output collimators at a same position coupled to optical fibers;
 - a mirror array with a plurality of movable mirrors in a common horizontal plane, said mirror array having optically coupled thereto a light leaving said collimator array;
 - a first mirror having optically coupled thereto the light leaving said movable mirrors of said mirror array;
 - a second mirror having optically coupled thereto the light leaving said first mirror; wherein the light leaving said second mirror passes through said first mirror and said mirror array, and optically couples to said collimator array,
 - wherein said movable mirrors of said mirror array switch combinations of said output collimators and said input collimators, and
 - said mirror array and said first mirror are disposed on collimator side compared to where said collimator array and said optical fiber are coupled in a longitudinal direction of said collimator array, and said second mirror is disposed on said optical fiber side compared to where said collimator array and said optical fiber array are coupled.
2. (Previously Presented) An optical switch comprising:
 - an input unit with a plurality of optical emitters coupled to optical fibers;
 - a mirror array with a plurality of movable mirrors illuminated by a light emitted from said optical emitters;

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a first mirror illuminated by the light leaving said mirrors of said mirror array;

a second mirror illuminated by the light leaving said first mirror; and
an output unit with a plurality of optical receivers coupled to optical fibers,

wherein the light leaving said second mirror passes through said first mirror and said mirror array and illuminates an optical receiver selected in said output unit, and

said mirror array and said first mirror are disposed on collimator side compared to where said collimator array and said optical fiber are coupled in a longitudinal direction of said collimator array, and said second mirror is disposed on said optical fiber side compared to where said collimator array and said optical fiber array are coupled.

3. (Previously Presented) An optical switch according to Claim 1, wherein said first and second mirrors are fixed in its plane direction.

4. (Canceled)

5. (Previously Presented) An optical switch according to Claim 1, wherein said mirror array and said first mirror are located more on the side of the collimators than the other side thereof where the collimators and said fibers are coupled in the longitudinal direction of said collimators.

6. (Previously Presented) An optical switch comprising:
a collimator array including a plurality of input collimators and output collimators at a same position coupled to optical fibers;

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a mirror array with a plurality of movable mirrors having optically coupled thereto a light leaving said collimator array;

a first mirror having optically coupled thereto the light leaving said movable mirrors of said mirror array;

a second mirror having optically coupled thereto the light leaving said first mirror; and

wherein light leaving said second mirror passes through said first mirror and said mirror array, and is optically coupled to said collimator array, and

said movable mirrors of said mirror array switch combinations of said output collimators and said input collimators,

wherein as viewed in a direction parallel with the direction of the optical path between the mirror array and the first mirror on the input side, the optical path between the first mirror and the second mirror is preferably formed in a position that the optical path laps over the collimator array, and

said mirror array and said first mirror are disposed on collimator side compared to where said collimator array and said optical fiber are coupled in a longitudinal direction of said collimator array, and said second mirror is disposed on said optical fiber side compared to where said collimator array and said optical fiber array are coupled.

7. (Original) An optical switch according to Claim 1, wherein the optical path between said first mirror and said second mirror is formed longer than the optical path between said movable mirrors of said mirror array and said first mirror.

8. (Original) An optical switch according to Claim 1, further comprising a base and a first support member mounted on said base, wherein said collimator array and said mirror array are mounted on said first support member.

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9. (Original) An optical switch according to Claim 1, wherein the number of arrays of collimators arranged in a direction parallel with the direction from the mirror array to the first mirror is smaller than the number of said collimators arranged in a direction at right angles to said direction.

10. (Original) An optical switch according to Claim 8, further comprising a second support member mounted on said base, wherein said second mirror is mounted to second support member, and wherein a plurality of connectors for externally applying voltages to said mirrors are installed in the base in a range between said first support member and said second support member.

11. (Previously Presented) A switch system comprising:
a board;
an optical switch coupled to optical fibers laid on said board for outputting light input from a first optical fiber to a second optical fiber selected by driving a movable mirror; and
a control IC for controlling a tilt of said movable mirror so that the input light is output to said second optical fiber,
wherein said optical switch comprises:
a collimator array including a plurality of input collimators and output collimators coupled to optical fibers;
a mirror array with a plurality of movable mirrors having optically coupled thereto a light leaving a first collimator coupled to said first optical fiber;
a first mirror having optically coupled thereto the light leaving said movable mirrors of said mirror array;
a second mirror having optically coupled thereto the light leaving said first mirror; and

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a second collimator of said collimator array, said collimator having the light from said second mirror coupled thereto,

wherein the light leaving said second mirror passes the said first mirror and said mirror array, and optically couples to said second output collimator,

said plurality of input collimators and output collimators are provided at a same position,

wherein light leaving said second mirror passes through said first mirror and said mirror array, and is optically coupled to said collimator array,

said movable mirrors of said mirror array switch combinations of said output collimators and said input collimators, and

said mirror array and said first mirror are disposed on collimator side compared to where said collimator array and said optical fiber are coupled in a longitudinal direction of said collimator array, and said second mirror is disposed on said optical fiber side compared to where said collimator array and said optical fiber array are coupled.

12. (Previously Presented) An optical switch comprising:

a first collimator array with a plurality of first collimators coupled to optical fibers;

a mirror array with a plurality of movable mirrors receiving a light from a collimator of said first collimator array;

a first mirror having optically coupled thereto light leaving a mirror of said mirror array; and

a second collimator array with a plurality of collimators coupled to optical fibers, a collimator of said second collimators having coupled thereto the light leaving said first mirror,

wherein said mirror of said mirror array has a common electrode for driving said plurality of movable mirrors, and

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said mirror array and said first mirror are disposed on collimator side compared to where said collimator array and said optical fiber are coupled in a longitudinal direction of said collimator array, and said second mirror is disposed on said optical fiber side compared to where said collimator array and said optical fiber array are coupled.

13. (Previously Presented) An optical switch according to claim 2, wherein said first mirror and said second mirror is fixed in its surface direction.

14. (Previously Presented) An optical switch according to claim 6, wherein said first mirror and said second mirror is fixed in its surface direction.

15. (Previously Presented) An optical switch according to claim 11, wherein said first mirror and said second mirror is fixed in its surface direction.

16. (Previously Presented) An optical switch according to claim 12, wherein said first mirror and said second mirror is fixed in its surface direction.

17. (Previously Presented) An optical switch according to claim 1, wherein optical path from said collimator to said mirror is in parallel with optical path from said first mirror to said second mirror.

18. (Previously Presented) An optical switch according to claim 42, wherein optical path from said collimator to said mirror is in parallel with optical path from said first mirror to said second mirror.

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19. (Previously Presented) An optical switch according to claim 6, wherein optical path from said collimator to said mirror is in parallel with optical path from said first mirror to said second mirror.

20. (Previously Presented) An optical switch according to claim 11, wherein optical path from said collimator to said mirror is in parallel with optical path from said first mirror to said second mirror.

21. (Previously Presented) An optical switch according to claim 12, wherein optical path from said collimator to said mirror is in parallel with optical path from said first mirror to said second mirror.